J. ent. Soc. sth. Afr. 1987
Vol. 50, No. 2, pp. 375–381

A new Afrotropical species of *Phyto* Robineau-Desvoidy (Diptera: Rhinophoridae)

by

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Phyto carinata sp. nov. is described from South Africa and the males of *P. stuckenbergi* Crosskey and *P. longirostris* Crosskey are described for the first time. It is argued that these three species constitute a monophyletic group within *Phyto* Robineau-Desvoidy. A revised key to Afrotropical species of *Phyto* is provided.

INTRODUCTION

The genus *Phyto* Robineau-Desvoidy is the largest genus within the Rhinophoridae, including 23 described species at present. Species richness is greatest in southern Europe, but the Afrotropical fauna is still only superficially known and it may contain several species in addition to the six known at present.

In his recent revision of Afrotropical Rhinophoridae, Crosskey (1977) described two closely related species which he tentatively assigned to *Phyto: P. stuckenbergi* and *P. longirostris*. They were described from the female only, and Crosskey noted that the integration of male characters is needed to confirm the generic assignment.

Rhinophoridae are generally sparse or overlooked in museum collections, but recently the male of both *P. stuckenbergi* and *P. longirostris* was recognized among unidentified material of South African Rhinophoridae from the Natal Museum, Pietermaritzburg (NMP), and the assignment to *Phyto* could be confirmed by reference to the structure of the male terminalia. In addition, specimens representing both sexes of an undescribed, closely related species were discovered.

The material examined is deposited in the Natal Museum, Pietermaritzburg (NMP), and the Zoological Museum, Copenhagen (ZMUC), as indicated in the text.

Key to Afrotropical species of *Phyto*

(Note: Females of *P. paratachinoides*, *P. tachinoides* and *P. parafacialis* are still unknown.)

1 Base of wing vein R$_{4+5}$ with one or more setae 2

— Base of wing vein R$_{4+5}$ totally bare 4

2(1) Three katepisternal (sternopleural) bristles. Three humeral bristles (in triangle). Arista distinctly plumose. Parafacial plate broad and well visible in profile 3

— Two katepisternal bristles. Two humeral bristles. Arista long pubescent. Parafacial plate narrow and only just visible on lower part in profile .... *parafacialis* Crosskey

3(2) Arista long plumose, hairing equally long on upper and lower surfaces and the longest hairs longer than the width of the frons at its narrowest point. Head ground colour entirely blackish; genal groove and frontal vitta velvety black (not paler than rest of the head). Abdominal T3–T4 with the dark colour extending forwards as an elongate blackish brown triangle on each tergite that has its apex at the anterior margin. Frons at narrowest point much narrower than third antennomere, not more than twice as wide as median ocellus (0,055 × head width) .... *paratachinoides* Crosskey

— Arista short plumose, hairing not as long on lower surface as upper surface and the longest hairs obviously shorter than the width of the frons at its narrowest point. Head not entirely black; genal groove and frontal vitta orange red, brick red or reddish brown. Abdominal T3–T4 with the dark areas slightly triangular but not extending forwards in the mid line to the anterior margins of the tergites. Frons at narrowest point only slightly narrower than third antennomere, conspicuously more than twice as wide as median ocellus (0,065 × head width) .... *tachinoides* (Curran)

4(1) Wing cell r_{4+5} closed at wing margin or very short petiolate. Notopleuron with hairs in addition to usual two bristles .... *stuckenbergi* Crosskey

— Wing cell r_{4+5} broadly open at wing margin (Fig. 14). Notopleuron without hairs in addition to usual two bristles 5

5(4) Facial plate with a strong median carina, which projects between the antennae. Vibrissal angle projecting slightly beyond antennal insertion (Fig. 13) .... *carinata* sp. nov.

— Facial plate with a weak carina, which does not project between the antennae. Vibrissal angle less prominent, not reaching level of antennal insertion (Crosskey 1977: Fig. 11) .. .. *longirostris* Crosskey

Phyto stuckenbergi Crosskey, Figs 1–4.

Phyto stuckenbergi Crosskey, 1977: 44.

Male. General appearance as the female (see description in Crosskey (1977: 44)). Frons broad, 0,36 × head width, frontal vitta at level of median ocellus 3,0 × width of one fronto-orbital plate. No proclinate orbital bristles. Prevertical bristle well developed and directed laterally, outer and inner verticals well developed. Lunula bare. Facial plate with a weak carina, which does not project between the antennae. Wing cell r_{4+5} very short petiolate. Claws about 0,75 × as long as fifth tarsomere. Terminalia with cerci and surstyli broader than in *P. longirostris* and *P. carinata* (Figs 1–2).

Length 5,9 mm.

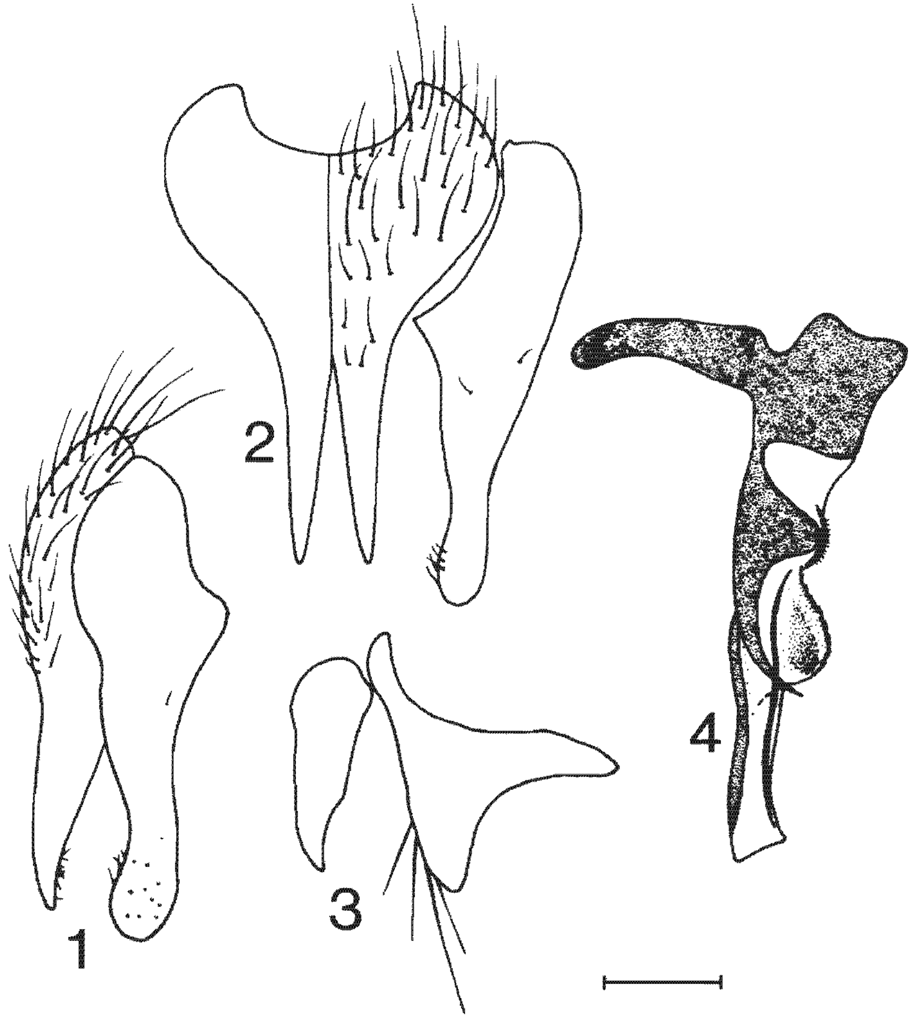
Material examined. SOUTH AFRICA: Cape Province, Bredasdorp District, Arniston coastal dunes, 1♂, 22–23.x.1964, B. & P. Stuckenberg (NMP). Note that the data are identical to those of the holotype and single paratype.

Phyto longirostris Crosskey, Figs 5–8.

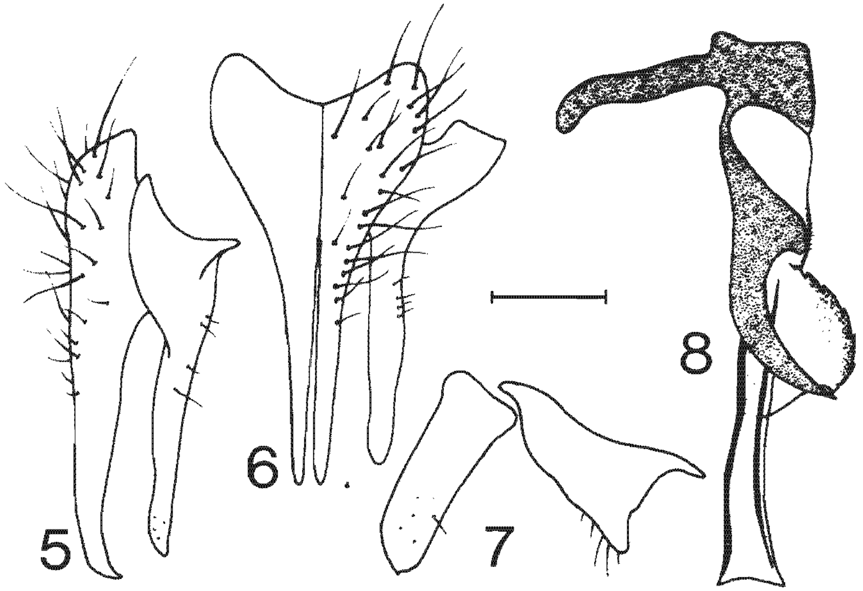
Phyto longirostris Crosskey, 1977:44

Male. General appearance as the female (see description in Crosskey (1977: 44)). Frons broad, 0,43 × head width, frontal vitta at level of median ocellus 3,0 × width of one fronto-orbital plate. No proclinate orbital bristles, or 1–2 proclinate bristly setae. Prevertical bristle well developed and directed laterally, outer and inner verticals well developed. Lunula bare. Facial plate with a weak carina, which does not project between the antennae. Wing venation similar to that of *P. carinata* (Fig. 14), with cell r_{4+5} broadly open and bend of vein M gently curved. Claws about 0,75 × as long as fifth tarsomere. Terminalia with slender cerci and surstyli.

Length 4,2–4,8 mm.



Figs 1–4. *Phyto stuckenbergi* ♂. – 1. Cerci and surstyli, lateral view. – 2. Cerci and right surstylus, posterior view, vestiture of left cercus omitted. – 3. Right paramere and gonopod. – 4. Aedeagus. – Scale: 0,1 mm.



Figs 5–8. *Phyto longirostris* ♂. – 5. Cerci and surstyli, lateral view. – 6. Cerci and right surstylus, posterior view, vestiture of left cercus omitted. – 7. Right paramere and gonopod. – 8. Aedeagus. – Scale: 0,1 mm.

MATERIAL EXAMINED. SOUTH AFRICA: Cape Province, Cape Town, Table Mountain slopes above cable house, 1♂ 10♀♀, 24.ix.1959 (B. & P. Stuckenberg) (2♀♀ in ZMUC, others in NMP), note that the data are identical to those of the holotype; Cape Province, Pringle Bay, 3418 BD, 1♂, 22.ix.1979, swept from vegetation near sea (J. Londt) (NMP); Cape Province, 5 km S Gordon's Bay, 3418 BB, 1♂, 22.ix.1979, mountain slope overlooking sea (J. Londt) (ZMUC).

Phyto carinata sp. nov., Figs 9–14.

Etymology: From the Latin: *Carina* = keel. The present species is the only species of Rhinophoridae known which possesses a distinct facial keel projecting between the antennae.

Male. Head black with genal groove and anterior part of frontal vitta reddish to light brown. Vibrissal edge distinctly warped forwards (Fig. 13), antennae slightly raised above lunula, and facial plate with a median carina, which projects between the first antennomeres. Frons broad, at vertex 0,35 × head width, frontal vitta at level of median ocellus 3,0 × width of one fronto-orbital plate. Frontal bristles, ocellars, and inner and outer verticals well developed. Fronto-orbital plate distinctly setose and with 1 proclinate orbital bristle and 1 lateroclinate prevertical bristle. Parafacial plate broad and setose in full extent. Lunula bare. Antennae short, third antennomere 1,7 × as long as second. Arista sparsely and shortly haired, hair-length not exceeding greatest aristal diameter. Proboscis long, prementum at least as long as head-height. Palpi slightly shorter than the antennae.

Thorax black with sparse grey pollinosity on antero-dorsal parts. Chaetotaxy: *acr* = 1 + 0, *dc* = 2 + 3, *ia* = 0 + 2, *pa* = 0 + 2, *h* = 2, *ph* = 2. Scutellum with 1 pair of lateral bristles at base and 1 pair of apicals, which are 0,5 × as long as the laterals. Notopleuron bare or with a single hair in addition to the usual two bristles. Katepisternal bristles 1 : 1, katepimeron bare.

Wings fumose, especially along the veins. Bend of vein M gently curved and cell r_{4+5} broadly open (Fig. 14). Costal spine not differentiated, base of vein R_{4+5} bare. Lower calypters slightly fumose.

Legs black. Fore tibia with (1-)2 *ad*. Mid tibia with (1-)2 *ad*, 1 *av*, and (1-)2 *pd*. Hind tibia with 2 *ad*, 1 *av*, and 2 *pd*. Claws about 0,75 × as long as fifth tarsomere.

Abdomen uniformly black, with a coating of very inconspicuous thin greyish pollinosity. T1 + 2 – T3 with marginal bristles restricted to lateral parts, and with some irregularly placed bristles at lateral parts of discs. T4 with irregularly placed discals and a complete row of marginals. Terminalia with slender cerci and surstyli (Figs 9–10).

Length 4,8–5,2 mm.

Female. Very like the male. Width of frons genrally greater, 0,35–0,41 × head width. Fronto-orbital plate occasionally with an additional proclinate orbital or reclinate prevertical bristle.

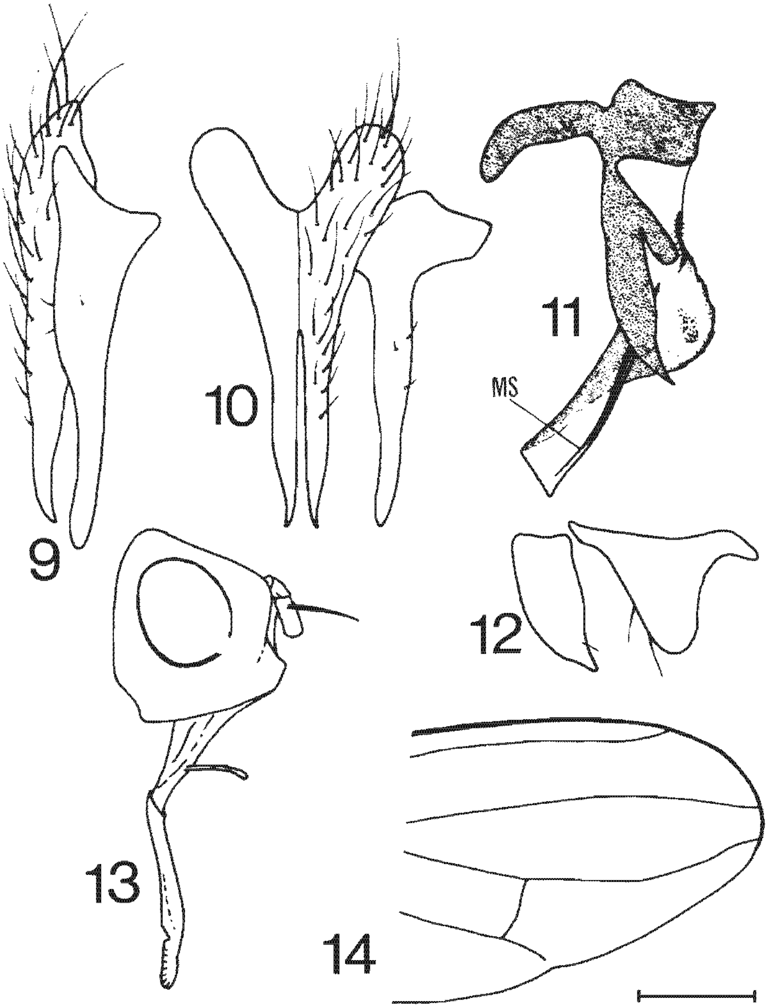
Length 4, 8–5, 8 mm.

MATERIAL EXAMINED: Holotype ♂, SOUTH AFRICA: Cape Province, Cape Peninsula, Cape Point Nature Reserve, 25.ix.1959 (B. & P. Stuckenberg) (NMP). Paratypes: 1 ♂ 4 ♀♀, data as holotype (1 ♂ 1 ♀ in ZMUC, others in NMP).

Two characters of great importance for the delimitation of *Phyto* are the thoracal pre-alar bristle (the anterior supra-alar) and the median sclerotization of the aedeagus. Crosskey (1977: 16) considers the pre-alar bristle to be 'the most important character of the thorax at the generic level', and Herting (1961) uses the size of this bristle as a key character in his monograph of the Palaearctic Rhinophoridae. The presence of a strong pre-alar bristle has a rather restricted occurrence in the Rhinophoridae, being found in only three species not classified within *Phyto*, namely *Rhinomorinia subrostrata* Villeneuve, *Comoromyia griseithorax* Crosskey, and *Queximyia flavipes* Crosskey (note that *Morinia* Robineau-Desvoidy is considered as belonging to the Calliphoridae and *Cirillia* Rondani as a synonym of *Phyto*, see discussion in Pape (1986). Both genera possess a strong pre-alar bristle).

All species of *Phyto* except one (*P. pauciseta* Herting) possess a strong pre-alar bristle, which is equal to or larger than the notopleural bristles, and this feature may reasonably be considered an apomorphy.

The median sclerotization (Mesohypophallus of Salzer (1968), Medianleiste des Ventralsklerits of Tschorsnig (1985), spermductsclerotization of Pape (1986)) is a sclerotization of the ventro-median wall of the distiphallic tube (Fig. 11), which runs from the ventral plates to the phallotreme. In all species of *Phyto* examined, the median sclerotization is desclerotized or completely membranous at base and not fused to the ventral plates as in most other Rhinophoridae. Only the monotypic genus *Parazamimus* Verbeke from Zaïre possesses a somewhat *Phyto*-like aedeagus with a similar median



Figs 9–14. *Phyto carinata* ♂. – 9. Cerci and surstyli, lateral view. – 10. Cerci and right surstylus, posterior view, vestiture of left cercus omitted. – 11. Aedeagus. – 12. Right paramere and gonopod. – 13. Head profile, outline only. – 14. Distal half of right wing. – Scale: Figs 9–12: 0,1 mm, Fig. 13: 0,3 mm, Fig. 14: 0,6 mm. Abbreviations: ms = median sclerotization.

sclerotization. The presence in *Phyto* of a median sclerotization may be plesiomorphic as this structure is widespread within the Tachinoidea, but the membranous base seems to be an apomorphy.

As *P. stuckenbergi*, *P. longirostris*, and *P. carinata* all possess a strong pre-alar bristle and a similar aedeagus with a basally membranous median sclerotization, and as they do not possess any apomorphic characters shared with species of other rhinophorid genera, their assignment to *Phyto* seems well corroborated.

Pape (1986) used the general presence within *Phyto* of lunular setae, additional notopleural hairs, and a haired katepimeron as characters corroborating a hypothesis of a sister-group relation between *Phyto* and *Baniassa* Kugler. If this is accepted, it will be necessary to consider the total absence of these characters in *P. longirostris* and *P. carinata* and the lack of both lunular setae and katepimeral hairs in *P. stuckenbergi* as secondarily derived.

At least four shared similarities of *P. stuckenbergi*, *P. longirostris*, and *P. carinata* are obviously apomorphic within the Rhinophoridae: (1) base of wing vein R_{4+5} bare, (2) proboscis elongated, (3) acrophallus very long, and (4) facial plate with a median carina. The latter character is interesting as its absence has been used in the family diagnosis (Crosskey 1977), and Pape (1986) uses the presence of a weak facial carina in *Morinia nigerrima* (Herting) (in combination with other characters) as evidence for excluding *Morinia* from the Rhinophoridae.

ACKNOWLEDGEMENT

I wish to extend my sincerest thanks to Dr J. G. H. Londt, Pietermaritzburg, for the loan of material.

REFERENCES

CROSSKEY, R. W. 1977. A review of the Rhinophoridae (Diptera) and a revision of the Afrotropical species. *Bulletin of the British Museum (Natural History), Entomology series* **36**(1): 1–66.

HERTING, B. 1961. Rhinophorinae. In: E. Lindner (ed.): *Die Fliegen der palaearktischen Region* 64e: 1–36, Stuttgart.

PAPE, T. 1986. A phylogenetic analysis of the woodlouse-flies (Diptera: Rhinophoridae). *Tijdschrift voor Entomologie* **129**: 15–34.

SALZER, R. 1968. Konstruktionsanatomische Untersuchungen des männlichen Postabdomens von *Calliphora erythrocephala* Meigen (Dipt). *Zeitschrift für Morphologie und Ökologie der Tiere* **63**: 155–238.

TSCHORSNIG, H.-P. 1985. Die Struktur des männlichen Postabdomens der Rhinophoridae (Diptera). *Stuttgarter Beiträge zur Naturkunde, ser. A* **375**: 1–18.

Accepted 16 October 1986